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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,581	08/31/2001	Takashi Moriuchi	010923	9413

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EXAMINER

WALLING, MEAGAN S

ART UNIT PAPER NUMBER

2863

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/942,581

Applicant(s)

MORIUCHI, TAKASHI

Examiner

Meagan S Walling

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 4 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over Hardesty et al. (US 6,138,056) in view of Ito et al. (US 6,456,896).

Regarding claim 1, Hardesty et al. teaches at least one of a temperature sensor for detecting the temperature of the machine tool, displacement sensor for detecting displacement of a predetermined portion of the machine tool, acceleration sensor for detecting the acceleration acting on the machine tool, and a noise meter for detecting noise caused by the machine tool (column 6, lines 31-34); and a reference value storage section for storing predetermined reference values indicative of standard conditions of the machine tool (column 6, lines 31-35).

Although Hardesty et al. teaches a judgment section for evaluating displacement (column 6, lines 42-47), Hardesty et al. does not teach a judgment section for evaluating at least one of a temperature increase characteristic of the machine tool, a thermal displacement characteristic of the machine tool in accordance with the temperature increase, a vibration characteristic of the machine tool, and a noise characteristic of the machine tool on the basis of a detection signal detected by the sensor and the reference values stored in the reference value storage section for judgment on the acceptability.

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Ito et al. teaches using a stored approximation formula along with measured data to judge and correct thermal displacement (column 1, lines 61-63, 67 – column 2, lines 1-5).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Hardesty et al. with the teachings of Ito et al. to store and evaluate thermal displacement characteristic information to determine whether correction is needed. The motivation for doing so is to prevent problems in machining due to the expansion of machine parts from the increase in temperature (Ito et al., column 1, lines 12-13, 18-21).

2. Claims 3 and 4 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Hardesty et al. in view of Ito et al. as applied to claim 1 above and further in view of Love et al. (US 5,629,871).

With regard to claims 3 and 4, Hardesty et al. and Ito et al. together disclose everything disclosed in the claimed invention except a judgment result storage section for storing the judgment result obtained by the judgment section (claim 3) and an estimate section for estimating future static and/or dynamic characteristics of the machine tool based on the judgment result stored in the judgment result storage section (claim 4).

Love et al. teaches storing the total number of abnormal events that have occurred when the operating conditions of the component under analysis exceeded the threshold and further recording the date and time of these occurrences for prediction means (column 7, lines 39-46).

Although Love et al. does not teach a machine tool maintenance system, Hardesty et al., Ito et al., and Love et al. each solve the problem of recording the accuracy of measurements by comparing measurements to known values.

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It would have been obvious to one skilled in the art at the time of the invention to combining the teachings of Hardesty et al. and Ito et al. with the invention of Love et al. It would be more time and cost efficient to predict future characteristics and trends of the machine tool than to have errors occur and be forced to make repairs. A way to predict future events is by observing a trend from the past. So by combining the teachings of Hardesty et al. and Ito et al. with the teachings of Love et al., it would be possible to predict future static and/or dynamic characteristics of the machine tool by storing past judgment results.

Allowable Subject Matter

3. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 requires a drive signal generator that generates a drive control signal to operate the main spindle unit and/or feeder for a trial and transmits the generated drive control signal to the machine tool.

Response to Arguments

Applicant's arguments filed November 24, 2003 have been fully considered but they are not persuasive.

Applicant argues that Ito et al. does not teach the judgment section for evaluating the thermal displacement characteristics of the machine tool in accordance with the temperature increase. However, the primary reference, Hardesty et al., teaches a judgment section for evaluating displacement (column 6, lines 42-47) and Ito et al. teaches using a stored

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approximation formula along with measured data to judge and correct thermal displacement. Therefore the combination of Hardesty et al. and Ito et al. does teach a judgment section for evaluating the thermal displacement characteristic of the machine tool in accordance with the temperature increase.

Applicant argues that Ito et al. fails to disclose the features of claim 1 concerning a judgment section for evaluating at least one of a temperature increase characteristic of the machine tool, a thermal displacement characteristic of the machine tool in accordance with the temperature increase, a vibration characteristic of the machine tool, and a noise characteristic of the machine tool on the basis of a detection signal detected by the sensor and the reference values stored in the reference value storage section for judgment on the acceptability. Applicant asserts that the teaching of Ito et al. that “the thermal displacement measurement by means of the sensors is made only when the correction amounts predicted by the approximation formula are substantial” fails to disclose the claimed invention. However, since the claimed invention does not specify whether the approximation is large or small, the combination of Hardesty et al. and Ito et al. teaches the claimed invention as described above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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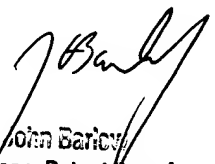
the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meagan S Walling whose telephone number is (571) 272-2283. The examiner can normally be reached on Monday through Friday 8:30 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

msw


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